

REMARKS

The Office Action dated October 11, 2005, has been received and carefully noted. The above amendments and the following remarks are submitted as a full and complete response thereto.

Claims 1-12 are pending in this application, with claims 1 and 7 being independent. By this Amendment, claims 1 and 5 have been amended, and new claims 7-12 have been added. No new matter has been added.

Rejections under 35 U.S.C. § 103(a)

Claims 1-4 were rejected under 35 U.S.C. § 103(a) as being unpatentable over Abiko et al. in view of Nakai et al. and Nakayama et al. Claims 1-4 were similarly rejected under 35 U.S.C. § 103(a) as being unpatentable over Abiko et al. in view of Nakai et al. and Nakayama et al., and further in view of Miyamoto et al. Claims 1-6 were rejected under 35 U.S.C. 103(a) as being unpatentable over the combination of Abiko et al. in view of Nakai et al., Nakayama et al., and Miyamoto et al., further in view of Uno et al. Applicants respectfully traverse these rejections.

An object of the present invention is to provide an improved rewritable optical disc capable of high-speed recording but remaining compatible with the existing DVD RW standard, by optimizing the compositions of recording layer and reflective layer, the thickness of dielectric (barrier) layer, the depths of grooves and land pre-pits, and the widths of the grooves.

This object is achieved by the presently-claimed invention, in which an information storage medium includes a substrate having grooves, lands formed between the grooves, and land pre-pits formed in the lands, where the grooves, the lands, and the land pre-pits are formed on one side of the substrate. A first dielectric layer, a phase-change recording layer, a second dielectric layer, and a reflective layer are also formed, in that order, on the same one side of the substrate. The information storage medium is rotated at a linear speed ranging from 3.49 to 7.0 m/sec while the phase-change recording layer in the grooves is irradiated with a 600 to 700 nm wavelength laser beam through an objective lens having a numerical aperture ranging from 0.55 to 0.7, thereby effecting information recording and reproduction. The phase-change recording layer is made of a Ge-In-Sb-Te material, and the reflective layer is made of an Ag-Nd-Cu material. The first dielectric layer has a thickness ranging from 65 to 85 nm, the phase-change recording layer has a thickness ranging from 10 to 20 nm, the second dielectric layer has a thickness ranging from 13 to 23 nm, and the reflective layer has a thickness ranging from 100 to 225 nm.

According to one embodiment of the presently claimed invention, the grooves have a width ranging from 200 to 229 nm, and a depth ranging from 25 to 50 nm. The land pre-pits have a depth in a range of plus-minus 3 nm relative to the depth of said grooves.

According to a second embodiment of the presently claimed invention, the grooves have a width ranging from 331 to 350 nm, and a depth ranging from 25 to 50

nm. The land pre-pits have a depth in a range of plus-minus 3 nm relative to the depth of said grooves.

By incorporating the features of the presently-claimed inventions whereby the grooves have a width ranging from 200 to 229 nm, or from 331 to 350 nm and a depth ranging from 25 to 50 nm, and the land pre-pits have a depth in a range of plus-minus 3 nm relative to the depth of said grooves, it is possible to achieve the advantage whereby, during high-speed information reproduction, signals obtained from the land pre-pits do not interfere with RF reproduction signals obtained from the grooves, so that there are no reproduction errors possibly caused due to noise contained in the RF signals. In this way, it is possible to greatly reduce adverse effects of land pre-pits, thus ensuring that the generation of high quality RF reproduction signals is possible even during high-speed reproduction. See specification, page 11, lines 7-18.

Abiko discloses an information storage medium having a groove width of 230-330 nm and a groove depth of greater than 25 and less than 45 nm, where the pit depth (wobbling amplitude) is greater than 25 nm and less than 40 nm.

Nakai is cited only for its disclosure of Ag-Nd-Cu reflective layers for use in optical information recording media.

Nakayama discloses an optical information recording medium having a groove width of 700 to 800 nm and a groove depth of 90 to 100 nm, and a relation between groove depth and pit depth that is approximately equal.

Although Abiko has the same object as the present inventions (ensuring high speed recording/reproduction), it is different from the present inventions in terms of its disc

structure, pit depth, and groove width and depth. Further combination with Nakai and Nakayama does not remedy the abovementioned deficiencies of Abiko with respect to the claimed inventions.

Miyamoto discloses a high density optical information recording medium having substantially concentric grooves and lands formed on a circular substrate, where information areas are formed in association with *both* the groove and the land. Prepits are disposed on a virtual extension line of the boundary between a groove and a land, and are *not* disposed on lands formed between grooves. The pit depth and groove depth can be made equal to each other, preferably within the range of 40 to 60 nm. The groove width is in the range of from 300 to 750 nm. However, one skilled in the art would not be motivated to combine the teachings of Miyamoto with Abiko, Nakai, and Nakayama to arrive at the presently-claimed inventions in which information is recorded in grooves, and prepits are disposed on lands formed between grooves, because doing so would render the medium of Miyamoto unsuitable for its intended purpose and change its principle of operation. See MPEP § 2143.01.

Uno is cited only for its disclosure of diffusion preventing layers comprising oxides and/or nitrides for use in optical information recording media.

Unlike the cited art references, the present inventions provide an improved phase-change disc capable of high speed recording/reproducing, in which pit depth and groove depth are made substantially equal to each other within a depth range of from 25 to 50 nm (land pre-pits have a depth in a range of plus-minus 3 nm relative to the depth of grooves), and groove width is either from 200 to 229 nm or from 331 to 350 nm, thereby inhibiting PI

errors due to an overwrite.

Accordingly, Applicants submit that Abiko does not disclose or suggest the claimed inventions, and that further combination with Nakai, Nakayama, and Uno does not remedy the deficiencies of Abiko with respect to the inventions (capable of producing the above-discussed advantages) set forth in claims 1 and 7. Applicants also submit that there would be no motivation for one skilled in the art to combine the teachings of Miyamoto with Abiko, Nakai, Nakayama, and Uno to arrive at the presently claimed inventions. Reconsideration and withdrawal of the outstanding rejections is respectfully requested.

Response to Comments

In response to Applicants' prior arguments, the Office Action indicates that

The physical distance between the pits and grooves is what prevents crosstalk between these, not the identical phase depth. The identical phase depth would actually prevent the phase (push/pull) mode of reading information from discriminating between these areas. Therefore the argument by the applicant is flawed on its face.

The statements regarding phase depth are contrary to Applicants findings (see specification, page 11, lines 8-18), and are not supported by documentary evidence. If the Office Action is taking official notice, Applicants respectfully request that a supporting citation be provided. See MPEP § 2144.03 A ("[A]ssertions of technical facts in the areas of esoteric technology or specific knowledge of the prior art must always be supported by citation to some reference work recognized as standard in the pertinent art") *citing In re Ahlert*, 424 F.2d 1088, 1091, 165 USPQ 418, 420-21 (CCPA

1970) (holding that notice of facts beyond the record taken by the examiner must be "capable of such instant and unquestionable demonstration as to defy dispute").

The Office Action further asserts that "[t]he rejection is based upon a plurality of references, therefore it is clear for the record that one single reference teaches all the embodiments." This statement is not understood, because if a single reference taught all of the claimed embodiments, there would be no need for obviousness rejections based upon a plurality of references. None of the cited references, alone or in combination, disclose or suggest the claimed inventions.

Conclusion

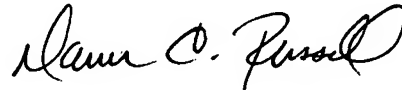
Applicants respectfully submit that this application is in condition for allowance and such action is earnestly solicited. If the Examiner believes that anything further is desirable in order to place this application in even better condition for allowance, the Examiner is requested to contact the Applicants' undersigned representative at the telephone number listed below to schedule a personal or telephone interview to discuss any remaining issues.

Amendment Under C.F.R. § 1.111
Application No.: 10/631,857

Attorney Docket No.: 107156-00196

In the event any fees are believed due with respect to this paper, please charge our
Deposit Account No. 01-2300, referencing attorney docket number 107156-00196.

Respectfully submitted,

A handwritten signature in black ink, appearing to read "Dawn C. Russell". The signature is fluid and cursive, with a large, stylized "D" at the beginning and a long, sweeping underline.

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